Implementation of the Rotor Manufacturing Induced Anomaly Database

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ABSTRACT

The Aerospace Industries Association (AIA) Propulsion Committee's Rotor Manufacturing (RoMan) Subcommittee has embarked on creating a knowledge base to serve as a tool for investigating manufacturing induced anomalies of rotor disks in commercial jet engines. The manufacturers of turbine engine components will provide information related to manufacturing induced anomalies of various rotating parts, together with the background information that will help relate these problems to manufacturing methods and materials. Such anomalies are known to initiate fracture and eventual fatigue failure of these parts. RoMan believes that this knowledge base will support a continuing lessons learned analysis that will assist the FAA and the engine industry to improve rotor safety by decreasing the occurrence of part failures.

The FAA sponsored grant (8/7/2000-7/31/2002) for the Implementation of the Rotor Manufacturing Induced Anomaly Database has successfully delivered an operational database, populated with sample data that Wichita State University has received from the manufacturing companies. The significant research activities, results, and accomplishments of this project include:

1. Logical Design of the Database
    - Addressing Sensitive/Non-Sensitive Data Concerns
    - Definition of An Incident
    - Capturing Incident Data; Feature Types; and Data on Damage(s)
    - Capturing Findings and Lessons Learned
2. The OEM Data Entry Application
    - A Solution to Address Sensitive/Non-Sensitive Data Concerns
    - A Solution to Address Anonymity Concerns

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- A Solution to Support User-Defined/Sensitive Data

3. The Data Warehousing/Consolidation Application
   - A Solution to the Versioning Control for Consolidating OEM Data
4. The Web-Based Delivery Features (Under Development)
   - The Development of A Search Engine
   - Knowledge Discovery Algorithms
   - Implementation of an Audit Trail
   - Implementation of Personalization Features

The strategic significance to the FAA and to each participating OEM, of developing an industry-wide knowledge base on lessons learned about manufacturing induced anomalies is fully recognized. The FAA and the RoMAN project have been quite sensitive to the necessary spirit of voluntary cooperation to share lessons learned. Publication of 14 CFR Part 193, *Protection of Voluntarily Submitted Information* has indeed helped that spirit. Nevertheless, the true contribution of this project must await full population of the database. And, as the database is maintained and evolves over time, its most tangible impact will be felt each time knowledge discovery from it leads to improved safety.